IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A device for producing optical pulses comprising:

an optical mirror comprising an input port, an output port, and a fiber optic loop having two ends, said input port optically connected to both ends of said fiber optic loop such that an optical pulse input into said input port is split into two lesser magnitude optical pulses which are counter-propagating pulses that propagate in opposite directions through said fiber optic loop, said output port also optically connected to each of said ends of said fiber optic loop so as to receive optical energy from both of said counter-propagating pulses,

wherein said fiber optic loop comprises a comb-like dispersion profiled fiber having three or more sections characterized by changes in dispersion and arranged to compress said pulses propagating therethrough, said sections having lengths such that said counter-propagating pulses are phase-shifted with respect to each other so as to optically interfere with each other to prevent noise associated with said optical pulses from being output from said output port.

Claim 2 (Original): The optical device of Claim 1, wherein sections of said comb-like dispersion profile fiber increase in length from one end of said fiber loop to said other end of said fiber loop.

Claim 3 (Original): The optical device of Claim 2, wherein said sections have a length between about 0.3 and about 200 meters.

Claim 4 (Original): The optical device of Claim 1, wherein said comb-like dispersion profile fiber comprises four or more sections delimited by changes in dispersion.

Claim 5 (Original): The optical device of Claim 1, wherein said comb-like dispersion profile fiber comprises six or more sections delimited by changes in dispersion.

Claim 6 (Original): The optical device of Claim 1, wherein said comb-like dispersion profile fiber comprises eight or more sections delimited by changes in dispersion.

Claim 7 (Original): The optical device of Claim 1, wherein said lengths and dispersive and nonlinear characteristics are selected such that an optical pulse propagating through said fiber optic loop is repeatedly compressed.

Claim 8 (Original): The optical device of Claim 1, further comprising an optical amplifier in said fiber optic loop.

Claim 9 (Original): The optical device of Claim 1, further comprising a chirp compensation fiber.

Claim 10 (Original): The optical device of Claim 1, further comprising at least one polarization controller within said fiber optic loop.

Claim 11 (Original): The optical device of Claim 1, wherein said comb-like dispersion profile fiber comprises polarization maintaining fiber.

Claim 12 (Original): The optical device of Claim 1, further comprising polarization controller optically coupled to said input of said optical mirror to regulate the polarization state of optical pulses input into said optical mirror.

Claim 13 (Original): The optical device of Claim 1, further comprising comb-like dispersion profile fiber optically coupled to said input of said optical mirror such that optical pulses are compressed prior to input into said optical mirror.

Claim 14 (Original): A device for producing optical pulses comprising:

a four-way optical coupler having four ports, an input port, two side ports and an output port, said coupler defining an optical path from said input port to said two side ports and from each of said two side ports to said output port such that light received by said optical coupler through said input port is coupled to each of said side ports and light entering either of said side ports may be directed through both said input port and said output port;

an optical path optically connecting said side ports such that light entering said input port and coupled to one of said side ports propagates through said optical path back into said other side port, said optic path comprising separate portions having different lengths and alternating in dispersive and nonlinear characteristics,

wherein said lengths, and dispersive and nonlinear characteristics are selected in accordance with characteristics of an input pulse such that input optical pulses propagating through said optical path are compressed in width and are phase shifted with respect to each other an amount to cause said pulses to interfere when combined in said optical coupler to separate out lower intensity noise components from peak signal components associated with said pulses.

Claim 15 (Original): The optical device of Claim 14, wherein said optical path comprises alternating sections imparting stronger non-linear effects and sections that introduce more dispersion.

Claim 16 (Original): The optical device of Claim 14, wherein said optical path comprises four or more sections.

Claim 17 (Original): The optical device of Claim 15, wherein said lengths and dispersive and nonlinear characteristics are selected such that an optical pulse propagating through said optical path is repeatedly compressed.

Claim 18 (Original): The optical device of Claim 17, wherein said lengths and dispersive and nonlinear characteristics are selected such that an optical pulse propagating through said optical path is repeatedly chirped producing frequency components that are swept in time.

Claim 19 (Original): The optical device of Claim 18, wherein said lengths and dispersive and nonlinear characteristics are selected such that spectral components within said chirped optical pulse are delayed so as to compress said pulse width.

Claim 20 (Original): The optical device of Claim 14, further comprising an optical amplifier in said optical path.

Claim 21 (Original): The optical device of Claim 14, further comprising a chirp compensation fiber optically connected to said output port of said optical fiber coupler.

Claim 22 (Original): An optical pulse generator for an optical communication system, said optical device comprising:

a pulsed laser light source;

a coupler having an input port configured to receive light from the pulsed laser light source and to distribute said light received into said input port into first and second intermediate ports, said light distributed into said first and second port propagating in a first direction, said coupler also including an output port configured to receive light from either of said first and second intermediate ports propagating in a second direction opposite said first direction; and

a separate optical path from said first intermediate port to said second intermediate port for light pulses propagating in said first direction clockwise from said first port to said second port and counter-clockwise from said second port to said first port, said optical path including a plurality of pairs of dispersive and non-linear optical sections, each pair configured to compress said optical pulses propagating therethrough, said plurality of pairs dispersive and non-linear optical sections having different lengths arranged to provide asymmetry such that said pulses traveling in said clockwise direction and said pulses traveling in said counter-clockwise direction experience different amounts of phase shift with respect to each other,

wherein said phase shift causes interference between said clockwise and counter-clockwise pulses combined within said coupler, said interference resulting in separation of low intensity noise from said compressed pulses output through said output port of said coupler.

Claim 23 (Original): The optical pulse generator of Claim 22, wherein said light source comprises a modulator for producing pulsed waveforms.

Claim 24 (Original): The optical pulse generator of Claim 22, wherein said light source comprises a plurality of optical sources having different wavelengths that are combined to produce a modulated light beam.

Claim 25 (Original): The optical pulse generator of Claim 22, further comprising an optical amplifier for amplifying the light output by said light source, said amplifier positioned to amplify said light prior to coupling into said optical coupler.

Claim 26 (Original): The optical pulse generator of Claim 22, further comprising an optical isolator positioned between said light source and said optical coupler.

Claim 27 (Original): The optical pulse generator of Claim 22, further comprising polarization controllers positioned between said light source and said optical coupler, said polarization controllers configured to set the polarization of said light input into said optical coupler.

Claim 28 (Original): The optical pulse generator of Claim 22, further comprising a plurality of dispersive and non-linear optical sections positioned between said light source and said optical coupler, said plurality of dispersive and non-linear optical sections configured to compress optical pulses propagating therethrough.

Claim 29 (Original): An optical pulse shaper comprising a CDPF having end portions coupled so as to form an optical loop mirror.

Claim 30 (Original): The optical pulse shaper of Claim 29, additionally comprising an optical amplifier located within said CDPF.

Claim 31 (Original): A method of compressing an optical pulse to provide a reduced pulse width and to remove noise, said method comprising:

splitting said optical pulse into first and second portions of lesser magnitude;

propagating said first portion in a first direction through a medium comprising at least four sections creating a comb-like dispersion profile, said sections alternating in dispersion level, said first portion undergoing pulse compression and phase shift with said propagation through said medium;

propagating said second portion in a second direction opposite to said first direction through said medium comprising at least four sections creating a comb-like dispersion profile, said second portion also undergoing pulse compression and phase shift with said propagation through said medium; and

combining and optically interfering said phase shifted pulse portions so as to at least partially eliminate said noise.

Claim 32 (Original): The method of Claim 31, wherein said four sections decrease in length in said first direction.

Claim 33 (Original): The method of Claim 31, wherein said medium comprises an optical waveguide.

Claim 34 (Original): The method of Claim 31, wherein said medium comprises an optical fiber.

Claim 35 (Original): A method of compressing an optical pulse to provide a reduced pulse width and to remove noise, said method comprising:

splitting said optical pulse into first and second optical pulses;

chirping said first optical pulse;

delaying selected frequency components of said chirped optical pulse to reduce the pulse width of said optical pulse;

further chirping and delaying said first optical pulse but to a different extent than before to further reduce the pulse width of said first optical pulse;

chirping and delaying said second optical pulse;

introducing different amounts of phase shift to said first and second pulses; and

combining said first and second optical pulses in a coupler to separate out high intensity components associated with a peak and low intensity components associated with said noise.

Claim 36 (Currently Amended): The ~~optical device~~ method of Claim 35, further comprising further chirping and delaying said second optical pulse but to a different extent than before to further reduce the pulse width of said second optical pulse.

Claim 37 (Original): A method of manufacturing an optical device for producing optical pulses, said method comprising:

optically coupling end portions of a fiber having three or more portions, wherein adjacent portions of said three or more portions have different dispersive characteristics so as to form an optical loop mirror; and

coupling a pulsed light source to said optical loop mirror.

Claim 38 (Original): An apparatus for compressing an optical pulse to provide a reduced pulse width and to remove noise, said apparatus comprising:

a first means of chirping a first optical pulse;

a first means of delaying selected frequency components of said chirped optical pulse to reduce the pulse width of said first optical pulse;

a second means of chirping said first optical pulse;

a second means of delaying said first optical pulse but to a different extent than before to further reduce the pulse width of said first optical pulse;

a first means of chirping a second optical pulse;

a second first means of delaying said second optical pulse to reduce the pulse width of said second optical pulse;

a means of introducing different amounts of phase shift to said first and second pulses; and

a means for interfering said first and second optical pulses to separate out high intensity components associated with a peak and low intensity components associated with said noise.